

This resource assessment is designed to gather and display information specific to Garfield County, Utah. This report will highlight the natural and social resources present in the county, detail specific concerns, and be used to aid in resource planning and target conservation assistance needs. This document is dynamic and will be updated as additional information is available through a multi-agency partnership effort. The general observations and summaries are listed first, followed by the specific resource inventories.

## Contents

[Observations and Summary](#)

[Land Use](#)

[Resource Concerns - Soils](#)

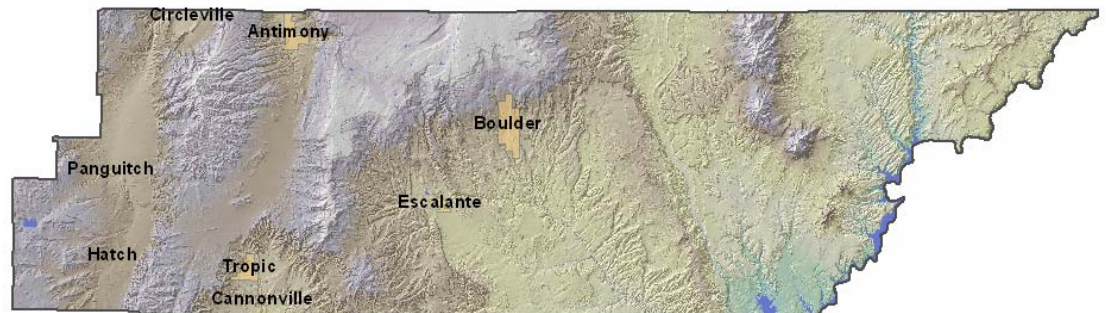
[Resource Concerns - Water](#)

[Resource Concerns - Air, Plants, Animals](#)

[Resource Concerns - Social and Economic](#)

[Survey Results](#)

[Footnotes/Bibliography](#)



## Introduction

Garfield County is located in the South Central Section of Utah. It lies approximately 36 miles north of the Utah-Arizona line and 370 miles south of the Utah-Idaho line. The main highway running north and south through the county is U.S. Highway 89. Scenic Byway 12 runs east and west through the county. This county is famous for many National and State Parks; Bryce Canyon, Capitol Reef, Calf Creek, Escalante Canyons, Anasazi Village, Petrified Forest, and Kodachrome Basin to name a few. Because of this most of the land in Garfield County is publicly owned.

The fifth largest county in the State of Utah, Garfield County has an area of 3,338,880 acres, is approximately 150 miles from east to west, and 43 miles from north to south. Only 4 percent of Garfield County is private land. The population is about 4,500.

Average January Temperatures: 24 degrees F; average July temperatures: 66 degrees F; average precipitation: 10.3 inches.

Equal Opportunity Providers and Employers.



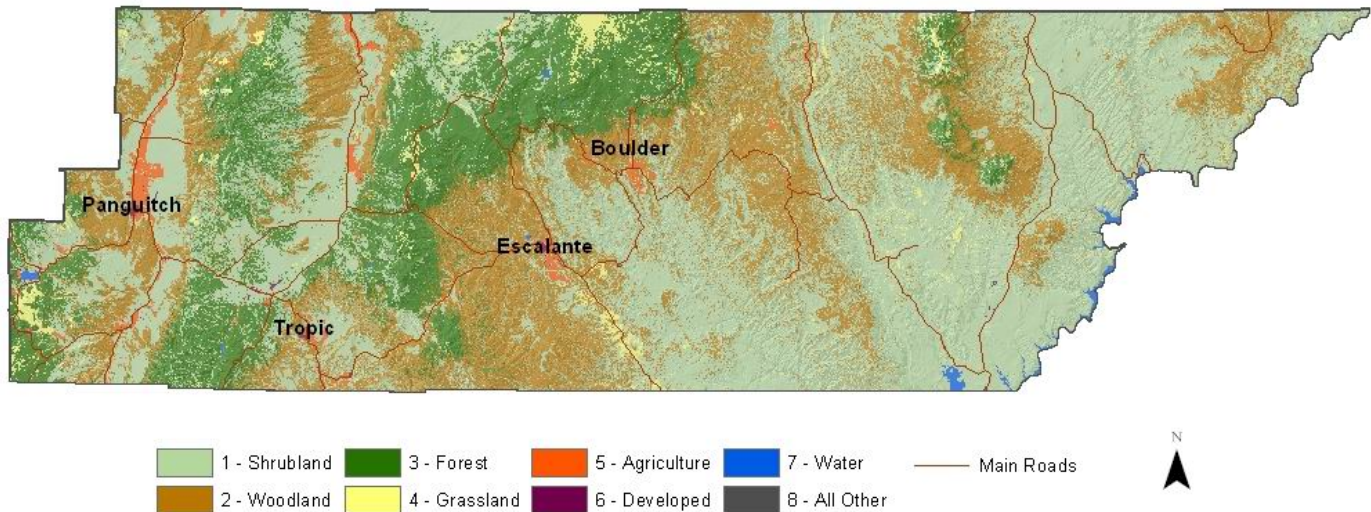
## General Land Use Observations

- Overgrazing in the past has led to many of our current issues with plant community composition and health of rangelands.
- It is a challenge getting most of the landowners to make wildlife a priority, especially when they are part-time and have many financial restraints.
- Noxious weeds and invasive plants are an ever increasing problem

## Resource Assessment Summary

Categories	Concern high, medium, or low	Description and Specific Location (quantify where possible)
Soil	High	Accelerated erosion due to wind is a rapidly increasing problem, especially in the valleys where the wind tends to be strong. Water erosion is less of a problem but it still occurs. Along the sevier river where there has been extreme flood events this year water erosion has increased quite a bit.
Water Quantity	medium	Some agriculture areas are still using inefficient irrigation methods affecting water quantity. Water is quite often in short supply over the alst few years. Water quantity is a concern for most landowners.
Water Quality Ground Water	low	Development in some areas, particularly summer home development near Panguitch Lake and Assay Creek, is a concern in contamination ofthe groundwater
Water Quality Surface Water	high	Riparian habitat and vegetation along the Sevier River and the East Fork as well as the Escalante River is lacking. There are eroding banks and lack of woody riparian vegetation. There is also concern from the sedimentation from run-off into the rivers
Air Quality	low	Air quality concerns are related to the issues described in the accelerated erosion due to wind above.
Plant Suitability	medium	Noxious weeds are a serious threat to agriculture lands and wildland areas. There are precenses of noxious weeds throughout the county especially in agriculture areas and tavel routes. The shrub rangelands are continually being invaded by Pinyon/Juniper trees which are undesirable species for these areas and unproductive.
Plant Condition	medium	The short growing season in the Panguitch, Hatch area limits the growth of commercial plants. Over grazing in the past and the mortality rate of existing plants is a problem on the rangelands.
Fish and Wildlife	high	Habitat is not always suitable for a diversity of wildlife species and it needs improvement. In agriculture areas management of wildlife is an issue.
Domestic Animals	low	
Social and Economic	low	Development in agriculture ares is an ever increasing problem especially in the Panguitch, Boulder, and Escalante areas. Agriculture and ranching needs to be maintained as a sustainable economic and cultural lifestyle.

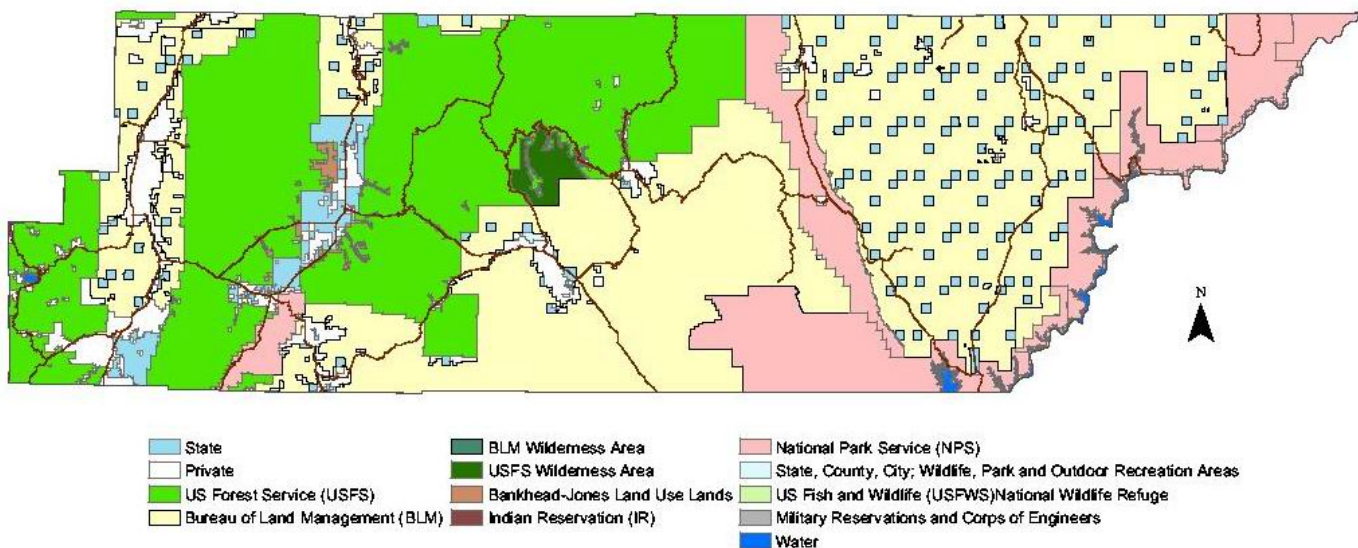
## Land Cover



Land Cover/Land Use		
	Acres	%
Forest	1,036,581	32%
Grain Crops	1,400	0%
Grass/Pasture/Haylands	20,300	1%
Shrub/Rangelands	2,139,677	66%
Water/Wetlands(approximate)	32,150	1%
Developed	27,000	1%
<b>Garfield County Totals *b</b>	<b>3,257,108</b>	<b>100%</b>
<i>*a: Estimate from Farm Service Agency records and include CRP/CREP.    *b: Totals may not add due to rounding and small unknown acreages.</i>		

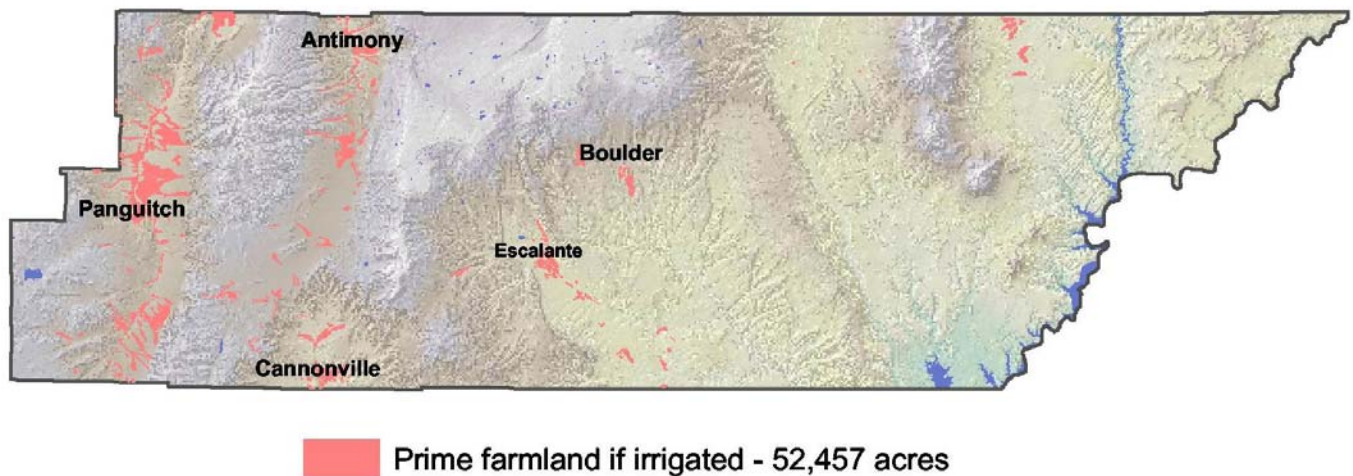
**Special Considerations for Garfield County:**

- 96 percent of Garfield County is in non-private land
- Most of the farms are livestock operations so if you include their federal and state grazing they are larger than the typical "farm" that just produces crops.
- Grass/Pasture/Hay includes approximately:
  - 5000 acres of pasture (FSA/Ag Statistics)
  - 11,500 acres of alfalfa hay (FSA/Ag Statistics)
  - 2,800 acres of other hay (FSA/Ag Statistics)
- There are approximately 1400 acres of grain (FSA/Ag Statistics)
- Shrub/rangelands consist of sagebrush flats and Pinyon/Juniper areas.
- 5 percent of the county consists of private land uses.

**Land Ownership**



## Prime & Unique Farm Land



### Prime farmland

land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion.

### Unique farmland

land other than prime farmland that is used for the production of specific high-value food and fiber crops...such as, citrus, tree nuts, olives, cranberries, fruits, and vegetables

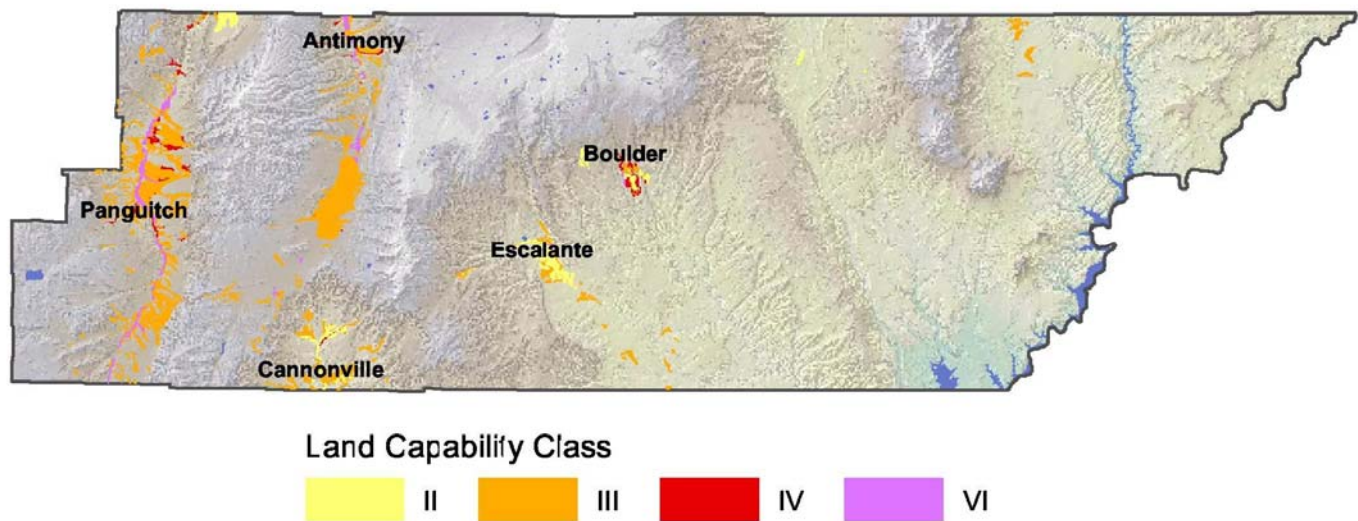
### Additional farmland of statewide or local importance

land identified by state or local agencies for agricultural use, but not of national significance

**Resource Concerns – SOILS**

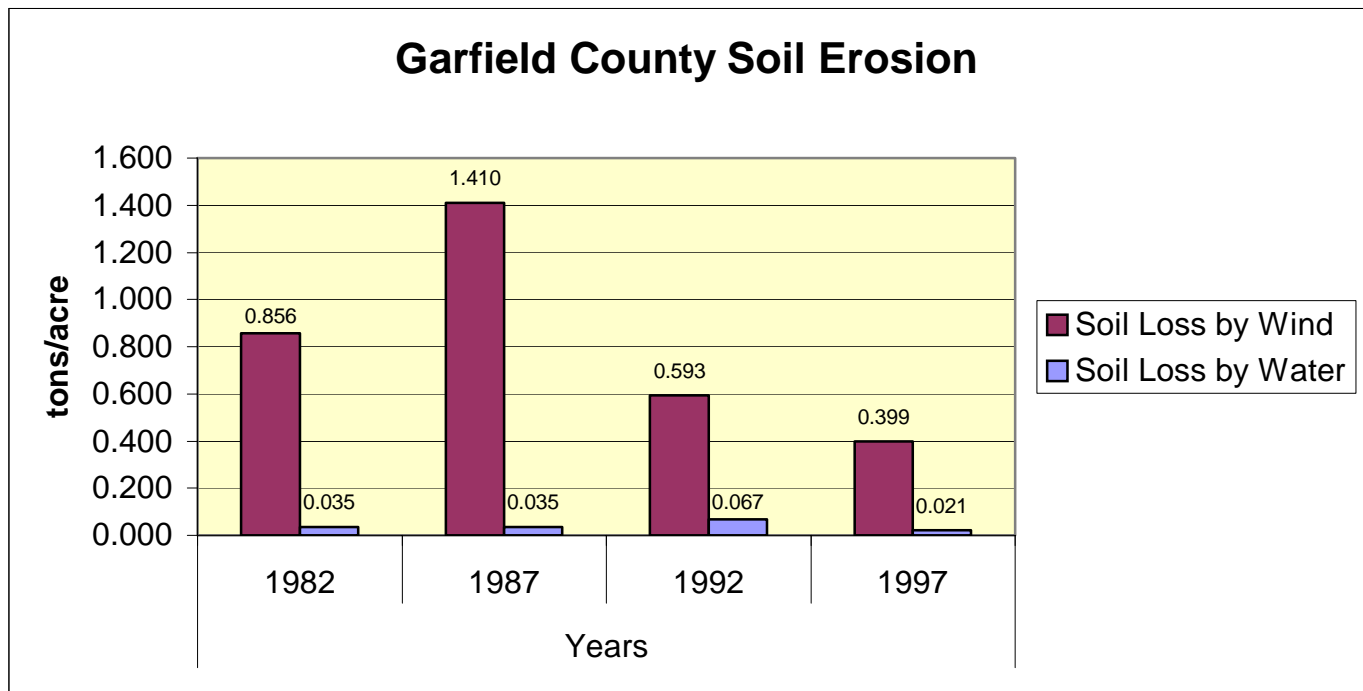
Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Soil Erosion	Sheet and Rill	x	x	x	x	x			x							x
	Wind	x	x	x	x				x				x			
	Streambank															
	Shoreline		x	x	x	x	x		x				x			x
	Irrigation-induced	x	x	x												
	Mass Movement									x						
	Road, roadsides and Construction Sites											x	x		x	
Soil Condition	Organic Matter Depletion	x	x													
	Rangeland Site Stability			x	x	x	x			x						
	Compaction	x	x	x									x		x	
	Contaminants: Animal Waste and Other OrganicsN			x												
	Contaminants: Animal Waste and Other OrganicsP	x	x	x												
	Contaminants: Animal Waste and Other OrganicsK															
	Contaminants : Commercial FertilizerN															
	Contaminants : Commercial FertilizerP	x	x	x												
	Contaminants : Commercial FertilizerK															
	ContaminantsResidual Pesticides	x	x													
	Damage from Sediment Deposition							x	x				x	x		

## Land Capability Class on Cropland and Pastureland



		Acres	Percentage
<b>Land Capability Class</b> (Irrigated Cropland & Pastureland Only)	I - slight limitations	0	0%
	II - moderate limitations	12,337	13%
	III - severe limitations	71,051	74%
	IV - very severe limitations	4,965	5%
	V - no erosion hazard, but other limitations	0	0%
	VI - severe limitations, unsuited for cultivation, limited to pasture, range, forest	7,093	7%
	VII - very severe limitations, unsuited for cultivation, limited to grazing, forest, wildlife	0	0%
	VIII - misc areas have limitations, limited to recreation, wildlife, and water supply	0	0%

## Soil Erosion



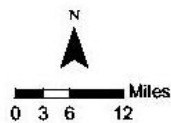
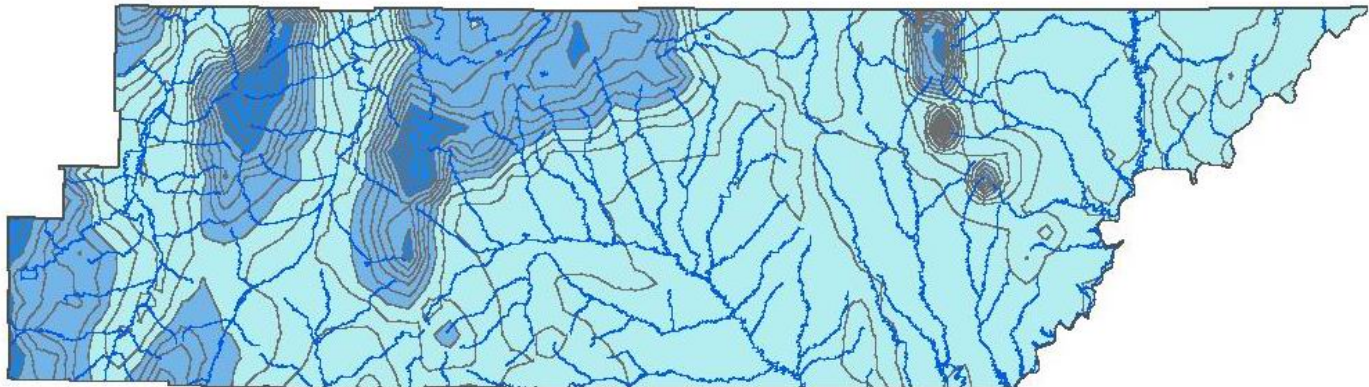
- ❖ Sheet and rill erosion by water on the subbasin croplands and pasturelands have been reduced by more than 50 thousand tons of soil per year from 1982 to 1997.
- ❖ NRI estimates indicate 1,400 acres of the subbasin agricultural land s still had water erosion rates above a sustainable level in 1997.
- ❖ Controlling erosion not only sustains the long-term productivity of the land, but also affects the amount of soil, pesticides, fertilizer, and other substances that move into the nation's waters.
- ❖ Through NRCS programs many farmers and ranchers have applied conservation practices to reduce the effects of erosion by water. As a result, erosion rates on croplands and pasturelands fell 60 percent from .035 to .021 tons/acre/year from 1982 to 1997.



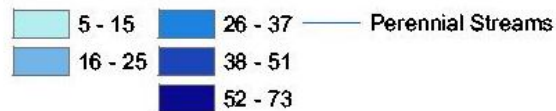
**Resource Concerns – WATER**

Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Water Quantity	Water Quantity – Rangeland Hydrologic Cycle				X	X	X	X	X	X						X
	Excessive Seepage															
	Excessive Runoff, Flooding, or Ponding								X							
	Excessive Subsurface Water															
	Drifted Snow															
	Inadequate Outlets															
	Inefficient Water Use on Irrigated Land	X	X	X												
	Inefficient Water Use on Non-irrigated Land															
	Reduced Capacity of Conveyances by Sediment Deposition			X	X				X							
	Reduced Storage of Water Bodies by Sediment Accumulation															
	Aquifer Overdraft															
	Insufficient Flows in Watercourses	X	X	X	X	X	X	X	X	X			X	X		
Water Quality, Groundwater	Harmful Levels of Pesticides in Groundwater															
	Excessive Nutrients and Organics in Groundwater															
	Excessive Salinity in Groundwater															
	Harmful Levels of Heavy Metals in Groundwater															
	Harmful Levels of Pathogens in Groundwater															
	Harmful Levels of Petroleum in Groundwater															
Water Quality, Surface	Harmful Levels of Pesticides in Surface Water															
	Excessive Nutrients and Organics in Surface Water	X	X	X												
	Excessive Suspended Sediment and Turbidity in Surface Water															
	Excessive Salinity in Surface Water															
	Water Quality – Colorado River Excessive Salinity															
	Harmful Levels of Heavy Metals in Surface Water															
	Harmful Temperatures of Surface Water															
	Harmful Levels of Pathogens in Surface Water															
	Harmful Levels of Petroleum in Surface Water															

## Precipitation and Streams



### Annual Precipitation (in/yr)



		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights	Surface		
	Well		
	<b>Total Irrigated Adjudicated Water Rights</b>	0.00	0.00
Stream Flow Data	USGS 09381500 Paria River Near Cannonville, UT	April-July Yield	89,000
		MILES	PERCENT
Stream Data	Total Miles - Major (100K Hydro GIS Layer)		n/a
	303d (DEQ Water Quality Limited Streams)		#DIV/0!

Irrigation Efficiency:		<40%	40 - 60%	>60%
Percentage of Total Acreage	Cropland	15%	25%	60%
	Pastureland	20%	70%	10%

**Watersheds & Total Maximum Daily Load (TMDL)**

<b>Watershed Projects, Plans, Studies and Assessments</b>			
<b>NRCS Watershed Projects</b>		<b>NRCS Watershed Plans, Studies &amp; Assessments</b>	
<b>Name</b>	<b>Status</b>	<b>Name</b>	<b>Status</b>
Upper Sevier River Community Watershed Project	Pending Completion	Upper sevier Watershed Management Plan	Complete
		Escalante River Watershed Water Quality Management Plan	Draft
		Paria River Watershed Water Quality management Plan	Draft
<b>DEQ TMDL's</b>		<b>NRCS Comprehensive Nutrient Management Plans</b>	
<b>Name</b>	<b>Status</b>	<b>Number</b>	<b>Status</b>

**AFO/CAFO**

<b>Animal Feeding Operations (AFO)</b>						
<b>Animal Type</b>	<b>Dairy</b>	<b>Feed Lot (Cattle)</b>	<b>Horses</b>	<b>Sheep</b>	<b>Mixed</b>	<b>Other</b>
<b>No. of Farms</b>	0	48	3	1	4	0
<b>No. of Animals</b>						

<b>Potential Confined Animal Feeding Operations (PCAFO)</b>						
<b>Animal Type</b>	<b>Dairy</b>	<b>Feed Lot (Cattle)</b>	<b>Horses</b>	<b>Sheep</b>	<b>Mixed</b>	<b>Other</b>
<b>No. of Farms</b>	0	4	1	0	2	0
<b>No. of Animals</b>						

<b>Confined Animal Feeding Operations - Utah CAFO Permit</b>					
<b>Animal Type</b>	<b>Dairy</b>	<b>Feed Lot (Cattle)</b>	<b>Horses</b>	<b>Sheep</b>	<b>Other</b>
<b>No. of Permitted Farms</b>	0	0	0	0	0
<b>No. of Permitted Animals</b>					

**Resource Concerns – AIR, PLANTS, ANIMALS**

Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Air Quality	Particulate matter less than 10 micrometers in diameter (PM 10)															
	Particulate matter less than 2.5 micrometers in diameter (PM 2.5)															
	Excessive Ozone															
	Excessive Greenhouse Gas: CO2 (carbon dioxide)															
	Excessive Greenhouse Gas: N2O (nitrous oxide)															
	Excessive Greenhouse Gas: CH4 (methane)															
	Ammonia (NH3)															
	Chemical Drift	X	X													
	Objectionable Odors										X					
	Reduced Visibility	X	X										X			
	Undesirable Air Movement															
	Adverse Air Temperature															
Plant Suitability	Plants not adapted or suited															
Plant Condition	Plant Condition – Productivity, Health and Vigor															
	Threatened or Endangered Plant Species: Plant Species Listed or Proposed for Listing under the Endangered Species Act				X	X	X									X
	Threatened or Endangered Plant Species: Declining Species, Species of Concern				X	X	X									X
	Noxious and Invasive Plants	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Forage Quality and Palatability				X	X	X									
	Plant Condition – Wildfire Hazard				X	X	X									
Fish and Wildlife	Inadequate Food				X	X	X	X	X							
	Inadequate Cover/Shelter	X	X	X												
	Inadequate Water				X	X		X								
	Inadequate Space															
	Habitat Fragmentation	X	X	X												
	Imbalance Among and Within Populations															
	Threatened and Endangered Species: Species Listed or Proposed for Listing under the Endangered Species Act	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Domestic Animals	Inadequate Quantities and Quality of Feed and Forage				X	X	X	X								
	Inadequate Shelter															
	Inadequate Stock Water				X	X	X									
	Stress and Mortality				X	X										

## Noxious Weeds

### Utah Noxious Weed List

The following weeds are officially designated and published as noxious for the State of Utah, as per the authority vested in the Commissioner of Agriculture under Section 4-17-3, Utah Noxious Weed Act:

- Bermudagrass\*\* (*cynodon dactylon*)
- Canada thistle (*cirsium arvense*)
- Diffuse knapweed (*centaurea diffusa*)
- Dyers woad (*isatis tinctoria* L.)
- Field bindweed (Wild Morning Glory) (*convolvulus arvensis*)
- Hoary cress (*cardaria draba*)
- Johnsongrass (*sorghum halepense*)
- Leafy spurge (*euphorbia esula*)
- Medusahead (*taeniatherum caput-medusae*)
- Musk thistle (*carduus nutans*)
- Perennial pepperweed (*lepidium latifolium*)
- Perennial sorghum (*sorghum halepense* L. & *sorghum alatum*)
- Purple loosestrife (*lythrum salicaria* L.)
- Quackgrass (*agropyron repens*)
- Russian knapweed (*centaurea repens*)
- Scotch thistle (*onopordum acanthium*)
- Spotted knapweed (*centaurea maculosa*)
- Squarrose knapweed (*centaurea squarrosa*)
- Yellow starthistle (*centaurea solstitialis*)

There are no additional noxious weeds declared by Garfield County (2003).



## Wildlife

The Utah Comprehensive Wildlife Conservation Strategy (CWCS) prioritizes native animal species according to conservation need. At-risk and declining species in need of conservation were identified by examining species biology and life history, populations, distribution, and threats. The following table lists species of greatest conservation concern in the county.

AT-RISK SPECIES				
	Common Name	Group	Primary Habitat	Secondary Habitat
<b>FEDERALLY-LISTED</b>				
<b>Endangered:</b>	California Condor (experimental)	Bird	Cliff	
	Southwestern Willow Flycatcher	Bird	Lowland Riparian	Mountain Riparian
	Bonytail	Fish	Water - Lotic	
	Colorado Pikeminnow	Fish	Water - Lotic	
	Humpback Chub	Fish	Water - Lotic	
	Razorback Sucker	Fish	Water - Lotic	
<b>Threatened:</b>	Mexican Spotted Owl	Bird	Cliff	Lowland Riparian
	Brown (Grizzly) Bear (extirpated)	Mammal	Mixed Conifer	Mountain Shrub
	Utah Prairie-dog	Mammal	Grassland	Agriculture
	Bald Eagle	Bird	Lowland Riparian	Agriculture
<b>Candidate:</b>	Yellow-billed Cuckoo	Bird	Lowland Riparian	Agriculture
<b>Proposed:</b>	(None)			
<b>STATE SENSITIVE</b>				
<b>Conservation Agreement Species:</b>	Northern Goshawk	Bird	Mixed Conifer	Aspen
	Colorado River Cutthroat Trout	Fish	Water - Lotic	Mountain Riparian
	Bluehead Sucker	Fish	Water - Lotic	Mountain Riparian
	Bonneville Cutthroat Trout	Fish	Water - Lotic	Mountain Riparian
	Roundtail Chub	Fish	Water - Lotic	
	Flannelmouth Sucker	Fish	Water - Lotic	
<b>Species of Concern:</b>	Allen's Big-eared Bat	Mammal	Lowland Riparian	Pinyon-Juniper
	Arizona Toad	Amphibian	Lowland Riparian	Wetland
	Black Canyon Pyrg	Mollusk	Wetland	
	Burrowing Owl	Bird	High Desert Scrub	Grassland
	Common Chuckwalla	Reptile	High Desert Scrub	Low Desert Scrub
	Desert Night Lizard	Reptile	Low Desert Scrub	Pinyon-Juniper
	Ferruginous Hawk	Bird	Pinyon-Juniper	Shrubsteppe
	Fringed Myotis	Mammal	Northern Oak	Pinyon-Juniper
	Greater Sage-grouse	Bird	Shrubsteppe	
	Kit Fox	Mammal	High Desert Scrub	
	Leatherside Chub	Fish	Water - Lotic	Mountain Riparian
	Lewis's Woodpecker	Bird	Ponderosa Pine	Lowland Riparian
	Long-billed Curlew	Bird	Grassland	Agriculture
	Pygmy Rabbit	Mammal	Shrubsteppe	
	Short-eared Owl	Bird	Wetland	Grassland
	Spotted Bat	Mammal	Low Desert Scrub	Cliff
	Three-toed Woodpecker	Bird	Sub-Alpine Conifer	Lodgepole Pine
	Townsend's Big-eared Bat	Mammal	Pinyon-Juniper	Mountain Shrub
	Utah Physa	Mollusk	Wetland	
	Western Toad	Amphibian	Wetland	Mountain Riparian

\*Definitions of habitat categories can be found in the Utah Comprehensive Wildlife Conservation Strategy.

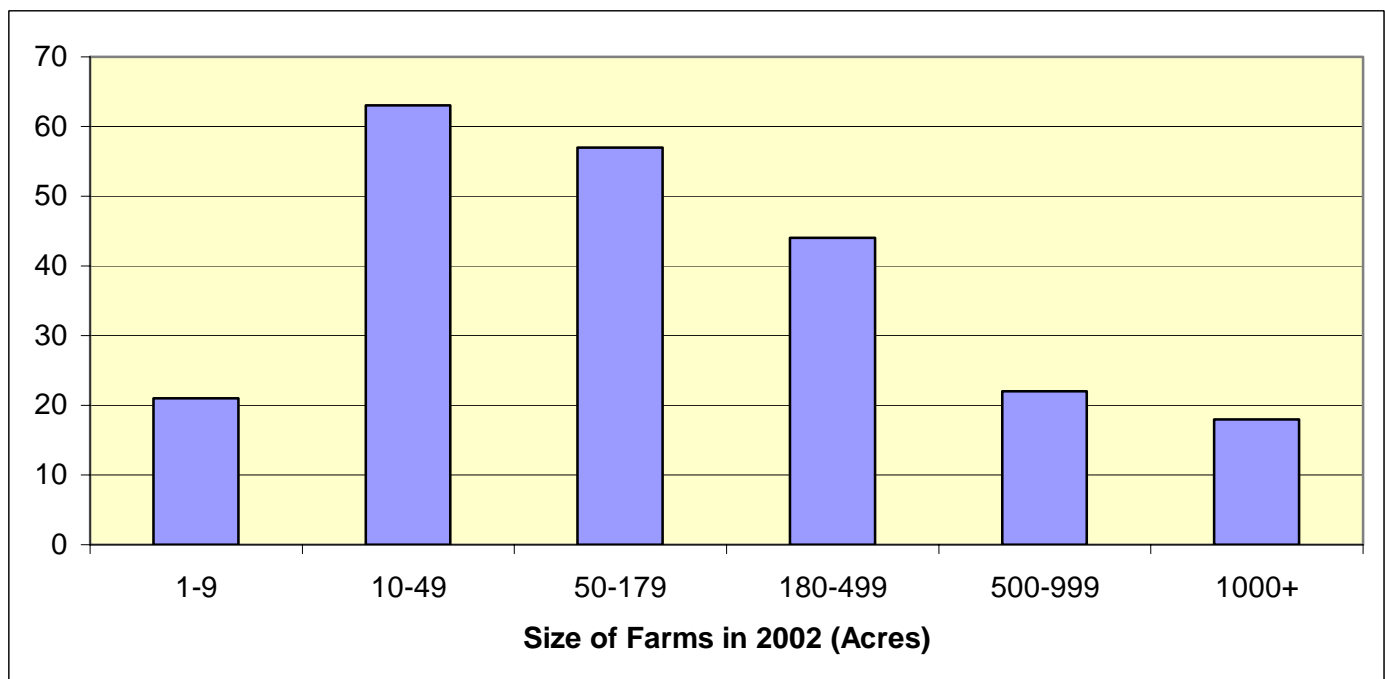
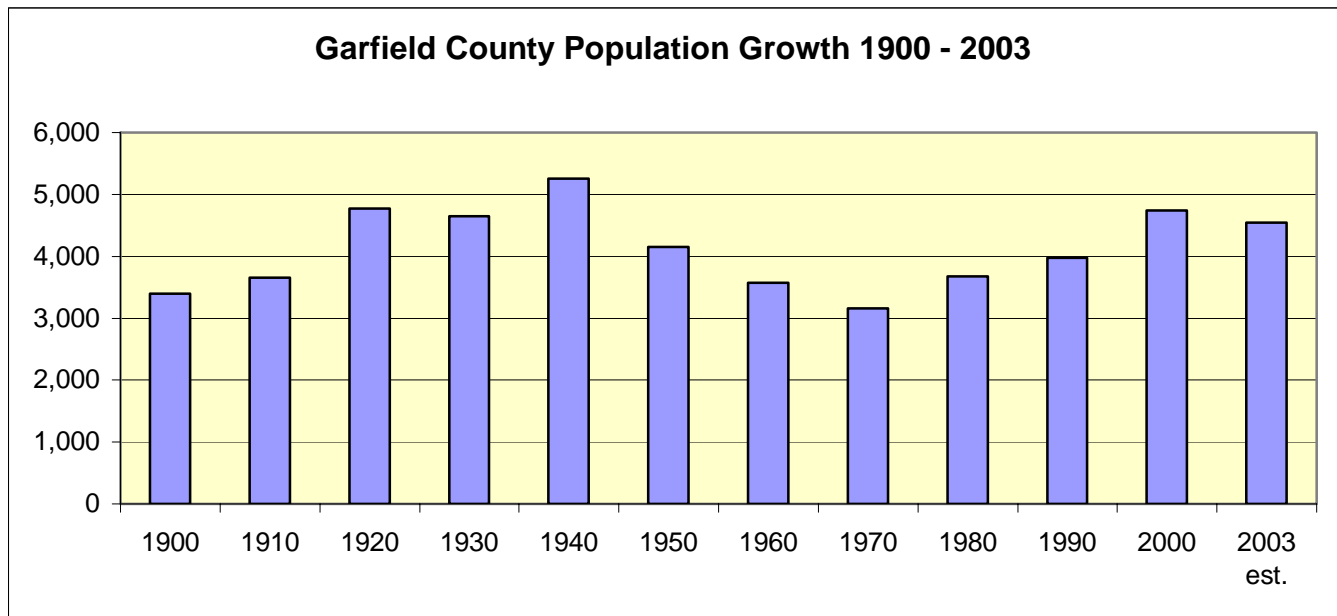
The Utah CWCS also prioritizes habitat categories based on several criteria important to the species of greatest conservation need. The top ten key habitats state-wide are (in order of priority):

- 1) **Lowland Riparian** (riparian areas <5,500 ft elevation; principal vegetation: Fremont cottonwood and willow)
- 2) **Wetland** (marsh <5,500 ft elevation; principal vegetation: cattail, bulrush, and sedge)
- 3) **Mountain Riparian** (riparian areas >5,500 ft elevation; principal vegetation: narrowleaf cottonwood, willow, alder, birch and dogwood)
- 4) **Shrubsteppe** (shrubland at 2,500 - 11,500 ft elevation; principal vegetation: sagebrush and perennial grasses)
- 5) **Mountain Shrub** (deciduous shrubland at 3,300 - 9,800 ft elevation; principal vegetation: mountain mahogany, cliff rose, bitterbrush, serviceberry, etc.)
- 6) **Water - Lotic** (open water; streams and rivers)
- 7) **Wet Meadow** (water saturated meadows at 3,300 - 9,800 ft elevation; principal vegetation: sedges, rushes, grasses and forbs)
- 8) **Grassland** (perennial and annual grasslands or herbaceous dry meadows at 2,200 - 9,000 ft elevation)
- 9) **Water - Lentic** (open water; lakes and reservoirs)
- 10) **Aspen** (deciduous aspen forest at 5,600 - 10,500 ft elevation)

## Resource Concerns – SOCIAL AND ECONOMIC

Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Social and Economic	Non-Traditional Landowners and Tenants		X	X												
	Urban Encroachment on Agricultural Land	X	X	X	X		X		X	X			X			
	Marketing of Resource Products															
	Innovation Needs															
	Non-Traditional Land Uses	X	X	X												
	Population Demographics, Changes and Trends	X	X	X												
	Special Considerations for Land Mangement (High State and Federal Percentage)				X	X	X			X			X			X
	Active Resource Groups (CRMs, etc)															
	Full Time vs Part Time Agricultural Communities	X	X	X	X	X	X									
	Size of Operating Units															
	Land Removed from Production through Easements															
	Land Removed from Production through USDA Programs															
Other																

## Census and Social Data



**Number of Farms: 601**

**Number of Operators:**

- Full-Time Operators: 32
- Part-Time Operators: 569

**Public Survey/Questionnaire Results:**

**Garfield County**  
 Resource Assessment Survey project  
 August 25, 2005  
 Canyonlands and Upper Sevier Soil Conservation Districts

The Canyonlands and Upper Sevier Conservation Districts received 31 resource assessment surveys from citizens/stakeholders in Garfield County From;

- 1) Upper Sevier SCD Survey Mail-out
- 2) Canyonlands Resource Assessment Public Meeting
- 3) Color Country RC&D Meetings
- 4) Panguitch Quilt Walk Festival
- 5) Upper Sevier Watershed Steering Committee Meeting
- 6) Garfield County Mail-out

Top Five Concerns that should be addressed **immediately:**

- |    |                                                       |     |
|----|-------------------------------------------------------|-----|
| 1. | Presence of invasive plants including noxious weeds   | 68% |
| 2. | Soil loss or erosion on land or along stream channels | 65% |
| 3. | Adequate water supply for desired uses                | 61% |
| 4. | Storm run-off or flooding                             | 52% |
| 5. | Adequate food, water and cover for livestock          | 39% |

Top Five Concerns that should be addressed in the **future:**

- |    |                                                        |     |
|----|--------------------------------------------------------|-----|
| 1. | Wildfire hazard                                        | 52% |
| 2. | Soil condition due to compaction or other changes      | 45% |
| 2. | Available clean water is clean enough for desired uses | 45% |
| 2. | Adequate energy sources available                      | 45% |
| 3. | Adequate food, water and cover available for wildlife  | 42% |
| 4. | Plant health, production and adequate quantities       | 39% |
| 5. | Soil loss or erosion on land or along stream channels  | 35% |
| 5. | Recreation Opportunities                               | 35% |

Garfield County Survey Demographics:

Gender-28 responses

Male- 70%

Female-21%

Age - 29 responses

18-24 – 0%

25-38 – 10%

39-50 – 24%

51-65 – 38%

66+ - 28%

Race/Ethnicity – 26 responses

European/Caucasian – 96%

Other – 4%

Ag Producers – 48%

Non-Ag Producers – 52%

## Footnotes / Bibliography

1. General information about Garfield County obtained from a Garfield County website and the NRCS office.
2. Location and land ownership maps made using GIS shapefiles from the Automated Geographical Reference Center (AGRC), a Utah State Division of Information Technology. Website: <http://agrc.utah.gov/>
3. Land Use/Land Cover layer developed by the Utah Department of Water Resources. A polygon coverage containing water-related land-use for all 2003 agricultural areas of the state of Utah. Compiled from initial USGS 7.5 minute Digital Raster Graphic waterbodies, individual farming fields and associated areas are digitized from Digital Orthophotos, then surveyed for their land use, crop type, irrigation method, and associated attributes.
4. Prime and Unique farmlands derived from SURGO Soils Survey UT607 and Soil Data Viewer. Definitions of Prime and Unique farmlands from U.S. Geological Survey, [http://water.usgs.gov/eap/env\\_guide/farmland.html#HDR5](http://water.usgs.gov/eap/env_guide/farmland.html#HDR5)
5. Land Capability Classes derived from SURGO Soils Survey UT607 and Soil Data Viewer.
6. Tons of Soil Loss by Water Erosion data gathered from National Resource Inventory (NRI) data. Estimates from the 1997 NRI Database (revised December 2000) replace all previous reports and estimates. Comparisons made using data published for the 1982, 1987, or 1992 NRI may produce erroneous results. This is due to changes in statistical estimation protocols, and because all data collected prior to 1997 were simultaneously reviewed (edited) as 1997 NRI data were collected. In addition, this December 2000 revision of the 1997 NRI data updates information released in December 1999 and corrects a computer error discovered in March 2000. For more information: <http://www.nrcs.usda.gov/technical/NRI/>
7. Precipitation data was developed by the Oregon Climate Service at Oregon State University using average monthly or annual precipitation from 1960 to 1990. Publication date: 1998. Data was downloaded from the Resource Data Gateway, <http://dgateway-wb01.lighthouse.itc.nrcs.usda.gov/lighthouse>
8. Irrigated Adjudicated Water Rights obtained from the Utah Division of Water Rights.
9. Stream Flow data from USGS website <http://www.usgs.gov>
10. Watershed information from Upper Sevier Watershed Management Plan, Escalante River Watershed Water Quality Management Plan, and Paria River Watershed Water Quality Management Plan
11. The 2003 noxious weed list was obtained from the State Of Utah Department of Food and Agriculture. For more information contact Steve Burningham, 801-538-7181 or visit their website at [http://ag.utah.gov/plantind/noxious\\_weeds.html](http://ag.utah.gov/plantind/noxious_weeds.html)



12. Wildlife information derived from the Utah Division of Wildlife Resources' Comprehensive Wildlife Conservation Strategy (CWCS) ( <http://wildlife.utah.gov/cwcs/> ) and from the Utah Conservation Data Center ( <http://dwrcdc.nr.utah.gov/ucdc/> ).

13. County population data from the U.S. Census Bureau, Utah Quick Facts, <http://quickfacts.census.gov/qfd/states/49000.html>

14. Farm information obtained from the National Agricultural Statistics Service, 2002 Census of Agriculture. <http://www.nass.usda.gov/census/census02/volume1/index2.htm>